

Universiti Sains Malaysia MBA Program

ADW 622 : Management Project

Factors that determine intellectual property strategy of the firm

**by
Lee Sooi Poh (SP Lee)**

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2010 Lee Sooi Poh (SP Lee)

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ABSTRAK

Kajian ini mengkaji beberapa faktor yang mungkin mempengaruhi sebuah syarikat melakukan pelanggaran harta intelek. Juga apakah polisi yang sesuatu kerajaan boleh buat untuk mempertingkatkan strategi harta intelek bagi negaranya.

Bentuk statistik yang di gunakan adalah ‘model regresi logit’ di mana yang ‘pembolehubah bersandar’ itu ialah ‘logarithma ods’ of the pelanggaran intelek’

Hasil statistik menunjukkan bahawa memanglah wujudnya hubungan antara kemungkinan pelanggaran harta intelek dengan saiz syarikat (bilangan pekerja dan jualan), negara asal syarikat, bidang perniagaan syarikat, dan sama ada syarikat tersebut membekalkan pelajaran atau latihan untuk harta intelek, dan sama ada mereka mempunyai kesedaran terhadap kepentingan harta intelek, ataupun sama ada mereka terlibat dalam usaha-usaha kajian dan pembangunan, atau mempunyai pertalian dengan syarikat-syarikat lain yang terlibat dalam bidang teknologi.

Walaupun sifat-sifat perniagaan dan saiz syarikat memang merupakan sebahagian daripada deskripsi sebuah syarikat, kesedaran terhadap kepentingan harta intelek dan usaha-usaha kajian dan pembangunan atau pertalian dengan syarikat-syarikat lain dalam bidang teknologi boleh dimajukan oleh pihak kerajaan melalui pelbagai cara, termasuklah pemberian insentif dan sebagainya.

Selain daripada itu, promosi secara aktif oleh organisasi harta intelek, dan juga bantuan mereka terhadap syarikat perniagaan dan juga komuniti, boleh juga membantu mengurangkan pelanggaran harta intelek

ABSTRACT

This study investigates the factors that influence the likelihood of a company infringing on intellectual property rights, and what are the policies that the Government can use to enhance its IP (intellectual property) strategy

The qualitative model used in the analysis is the logit regression model where the dependent variable is the logarithm of the odds of IP infringement.

The results show the probability of intellectual property infringement depends on the size of the company (number of employee and sales), the country of origin of the company, the nature of the company's business or field of works and whether the company provides IP education and training, whether the company has IP awareness, and whether the company has R&D or some sort of technology alliance.

While the nature of business and the company size are inherent to an individual company, IP awareness & education, R&D and technology alliance can be enhanced through government's efforts and incentives. In addition, the IP organization's active promotion and assistance to the business companies and the community also helps to reduce IP infringement.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Humans have destroyed a vast proportion of the natural world through unsustainable development, whether it is

- (1) mass extinction of global biodiversity inhabits forested areas,
- (2) undesirable emission to the atmosphere resulting in climate change,
- (3) soil, air, and water pollution

However let us not forget that there exists an equally valuable asset that is also in danger of “extinction” if humans continue to abuse it through unsustainable exploitation. This asset is human talents in invention, research and innovation creating intellectual property for sustainable economic, socio-political development. We must realize that preserving intellectual property (IP) sustainability is as important as preserving environmental sustainability

To avoid the danger of “extinction” of human talents in invention, research and innovation, we need to ensure that IP protection strategy is well implemented so that its creator, inventor or composer remains motivated. But we also need to bear in mind denial of access to certain IP information will be a barrier to progress and development as well. Sometimes it even create a standstill when machinery cannot be repaired and works cannot continue. Hence while IP protection is important, the approach through motivation is more rewarding than through punishment.

This research will study, identify and investigate:

- (1) what are the factors that motivate organization and people to heed intellectually property strategy and observe IP protection.
- (2) whether there is a relationship of the profile of the organization and people and the

likelihood of their IP infringement.

(3) whether efforts to create more IP awareness, educate and train people on IP strategy, and encourage more R&D activities & technology alliance will help a company to refrain from IP infringement or not.

(4) What action can the Government and IP associations take to enhance IP protection

Although the scope of intellectual properties today is so wide, it falls under a few broad categories:- technology, design, innovation, invention and patent, copyrights, trademarks, trade secrets, and more recently digital IP. (Bouchoux 2001). These are explained in Section 1.6.

Software intellectual property rights are the most vulnerable to be infringed besides copyrights in entertainment music, video etc. Engineering and inventions are another areas whereby imitations are common practice. Reversed engineering is widely used by engineering services companies.

Organizations and people of different backgrounds will have different requirements in software, technology, engineering patents, copyrights. Hence the tendency for IP infringement varies for organizations and people of different profiles.

It is believed that companies with strong financial and human resources are less likely to infringe on IP. Companies who operate in less developed countries with the people less conscious about IP protection are more likely to infringe on IP. Companies whose business are strongly dependent on technology know-how and do not have the ability to develop it themselves are forced to resort to IP thefts.

Governments of most nations through their agencies such as in Malaysia MITA help to promote IP Protection, while Trade Associations and Voluntary Organizations such World

Intellectual Property Organization (WIPO), the Business Software Alliance (BSA) etc also actively help out.

1.2 Problem Statement

Intellectual Property is so important that the issue appears regularly in many Books, journals and publications on Law, International Business, Trade Organizations agreements. There are a number of study on the subject, but not many had attempted to analyze the actual economics of good governance on intellectual property or on factors affecting IP infringement globally. (Bouchoux 2001)

Regardless of what product an enterprise makes or what service it provides, it is likely that it is regularly using and creating a great deal of intellectual property. This being the case, the enterprise should systematically consider the steps required for protecting, managing and enforcing it, so as to get the best possible commercial results from its ownership. If a company is using intellectual property that belongs to others, then the company should consider buying it or acquiring the rights to use it by taking a license in order to avoid a dispute and consequent expensive litigation.(WIPO SME 2010)

When IP is legally protected and there is a demand for the IP-protected products and/or services in the market place, IP can become a valuable business asset

- IP may generate income for the company through the licensing, sale, or commercialization of the IP-protected products or services that may significantly improve an enterprise's market share or raise its profit margins.
- IP rights can enhance the value or worth of the company in the eyes of investors and financing institutions.
- In the event of a sale, merger or acquisition, IP assets may significantly raise the value of the enterprise, and at times may be the primary or only true assets of value.

Strategic utilization of IP assets can, therefore, substantially enhance the competitiveness of an enterprise. And adherence to IP protection will not only saved the company consequent expensive litigation, it will earned high respect for the company from government and society.

In the past, most of the IP studies and education materials had a legal orientation, even though businesses had a real need for a business-oriented IP education. (WIPO 2010)

The majority of the studies are on encouraging and helping companies to apply for patents and copyrights to protect their intellectual property, few were done to encourage companies to refrain from IP infringement.

Although IP infringement can never be eliminated completely, it certainly needs to be kept under control. And knowing the motivational factors is one important step towards understanding the underlying problems on why companies fringe on IP and how to motivate companies not to commit act of IP infringement.

The factors are number of employees, IP awareness, technology, R&D, country of origin, nature of company business and the size/turnover of the company.

1.3 Research Objectives

The best approach to promote any good governance practice is through voluntary commitment. A properly formulated intellectual property strategy well implemented will lead the country to become an innovation-oriented economy, enhance the national innovative ability and increase international competitiveness, and hence sustainability.

Thus the main objectives of this study are:

- (1) To determine whether number of employee in the company, IP awareness, R&D and technology, country of origin, nature of company business and sales turnover influence intellectual property strategy
- (2) To identify those factors that the Government or IP organizations can use to

monitor or intervene by education , enforcement and punishment, motivation or incentive to help reduce IP infringement

1.4 Research Questions

This study attempts to answer the following questions:-

- a) Do these factors, namely, number of employees in the company, IP awareness, R&D and technology, country of origin, nature of company's business, sales turnover of the company has a negative relationship to IP infringement?
- b) What is the effect on the probability of a company infringement on IP when each of these factors changes. In other words, what are the marginal effects of changes in the number of employees in the company, IP awareness, R&D and technology, country of origin, nature of company's business, sales turnover of the company on IP infringement
- c) What are the policy variables that the Government can use to enhance its IP strategy?

1.5 Significance of Study

Intellectual Property is such an important issue today that it has strong impact on the economic, social & political development of many nations. Internationally, many treaties and trade agreements are signed to foster better cooperation in promoting intellectual property strategies, either to enhance the awareness and adherence to intellectual property rights, in order to enjoy the economic benefits of good governance on intellectual property, or to comply to IP

This study will be helpful to governments to determine what action which be taken to promote IP strategy such as to increase IP awareness, educate the people and companies on IP benefits and incentive.

1.6 Definition of key terms

Below are the definition of some of the terms used in this study:-

a) IP – intellectual property

Intellectual property (IP) is any intangible asset that consists of human knowledge and ideas

It refers to creations of the mind: inventions, literary and artistic works, symbols and designs.

Legally Intellectual property is a property right that can be protected under the law

b) Patent

A patent is a set of exclusive rights granted by the relevant Authority to an inventor or their

Assignee. Different types of patents may have varying patent terms (i.e. durations).

c) Trademark

A trade mark is a sign which distinguishes the goods and services of one trader from those of another

d) Copyrights

Copyright is primarily an exclusive right to reproduce an original work. That right falls to the person who created the work or to her employer. But unlike patents, copyrights aren't granted by the government after a complex and expensive application process. Instead a copyright automatically attaches to an original work as soon as it is created. (Charmasson 2004)

e) Trade secrets

Trade secrets are information that companies keep secret to give them an advantage over their Competitors. Protection for trade secrets is done by non-disclosure, the information must be kept confidential.

f) Digital IP

Digital intellectual property are associated with digital asset, multi media and internet activities.

A digital asset is a digital file or data that represents a valuable form of media. Digital assets may be in the form of media files, software (e.g. applications) or information content (e.g. media programs).

The terms ‘web’ and ‘internet’ are often mistakenly used interchangeably. Web is just one of the many internet services which include e-mail, instant messaging, on-line chat groups and more. (Waxer 2006)

Some of the key types of digital assets include digital audio, images, video, animation and application programs. There can be many other types of digital assets including web pages, scripted programs (e.g. Javascript files), fonts and other types of media that can be represented in digital form

Traditional, paper-based works were not so easy to copy or forge. Modern technology has radically changed this situation. Now it is very easy and cheap to download and copy most works on electronic media. (Clausen 2004). On top the copied documents can be easily edited or altered, a further infringement of moral rights.

g) Licensing

Licensing refers to the granting of permission to use intellectual property rights, such as trademarks, patents, or technology

1.7 Organization of remaining Chapters

This chapter gives the overall introduction, problem statement, objectives of the study, research questions and significance of the study.

The next two chapters will provide the literature review, theoretical framework, hypotheses, methodology and research design, data collection method and questionnaires design

The results and analysis are presented in Chapter 4. The detailed results which are based on a logit model are attached as an appendix as reference

The last chapter covers discussion and conclusion

CHAPTER 2

LITERATURE REVIEW

2.1 Importance of Intellectual Property (IP)

It is evident that IP issues are in our daily life. When you purchase an air-ticket on line, when you perform on-line transactions on your banking services, when you stay in a hotel and uses its internet services etc, you are constantly subject to IP strategy. Even as a student in USM, you are constantly warned of plagiarism !

Your bank wants you to indemnify them against any “intrusion” to your privacy and your personal IP such as your identity. On the other hand they want you to adhere to their IP and copyright rules & regulations. (UOB, 2010)

When you stay in a hotel, the moment you turn on your laptop and log-in the hotel internet, you are subject to the hotel’s internet rules which include many IP issues. (Refer attached Manila Peninsula Hotel Internet usage rules on responsibilities of guest regarding unauthorized copying or downloading of copy-right-protected materials).

The IP described above is on Digital IP which is the most current issue, However there are many other IP issues such as inventions and patents, trade mark, trade secret, copyright etc that are equally important in our work and our life. Many research has been conducted on these IP matters, many books had been written on them, many presentations had been conducted on the subject, many publications on IP have appeared on many journals. There are plenty of literature for the researcher to read as reference on IP strategy.

In the study done by Florian, the results of the impact of IP infringement on loss of revenue and additional expenditure as consequence of product piracy affirm the importance of I P strategy. It shows that total monetary impact for companies is estimated to 6.2% of yearly turnover (Kohler 2009)

This chapter covers the literature review, on empirical studies on IP. The concepts and

ideas from these studies provide the foundations for the theoretical framework of this study. Hypotheses were subsequently developed.

2.2.1 Intellectual Property and Strategy

Intellectual property (IP) refers to the creations of the mind, inventions, literary and artistic works. Owners are granted certain exclusive rights to a variety of intangible assets, such as musical, literary, and artistic works; discoveries and inventions; and words, phrases, symbols, and designs.

The common types of intellectual property include inventions and patents, industrial design rights, trade marks, trade secrets, copyrights which includes literary and artistic works such as novels, paintings, music and songs, and architectural designs. It is noted that computer programs and software are classified as literary works

2.2.1.1 Intellectual Property Strategy

An IP strategy is a set of measures formulated and implemented by a government with inputs from the private sector and universities and research institutions to encourage and facilitate effective creation, development and management of intellectual property. It outlines how to develop infrastructures and capacities to support inventors of IP to protect, develop and exploit their inventions. An IP strategy may also be defined as a comprehensive national document which outlines how all the policy developments and implementation take place in a coordinated manner within a national framework.

It therefore spells out how best to develop the talent base for an innovation system that attracts foreign direct investment, and help in building an inclusive economy.

The goal of an IP strategy is the creation, ownership and management of IP assets to meet national needs and to increase economic growth, to promote and strengthen scientific and technological research, development and commercialization. Such strategies may also

address cultural development and industries. They are integrated with other relevant national strategies and institutional policies in science, education, finance and trade.

A basic IP strategy would include at least the following: Policy on IP Acquisition, on IP Exploitation, IP Monitoring, IP Enforcement (WIPO SME 2010)

2.2.1.2 Why Is An Intellectual Property Strategy Useful?

An IP strategy is useful because it strengthens a nation's ability to generate economically valuable IP assets. All nations have rich human capital, universities, research institutions and entrepreneurial businesses. The goal of IP strategy is to provide a plan over time whereby all national stakeholders can work together to create, own, and exploit research results, innovations, new technologies and works of creativity

It must be stressed that the role of intellectual property is to harness national brands and increase international competitiveness, as well as promote scientific and research activities to obtain proprietary IP rights in key areas and facilitate a faster transition from research results to enhanced productivity. In addition, IP improves research and development performance in order to respond to economic challenges and opportunities, and it ensures that a growing number of firms benefit from the commercial application of knowledge

IP is relevant in today's global organization because IP is a business asset as well as investment. The value of IP assets is enormous. IP is important for organizational sustainability.

2.2.2 Invention and patent ; Trademarks and Industrial Design

A patent is a property right in inventions, that is, in devices or processes that perform a “useful” function. A patent effectively grants the inventor a limited monopoly on the manufacture, use, or sale of the invention. However, a patent actually only grants to the patentee the right to exclude (i.e., to prevent others from practicing the patented invention); it

does not actually grant to the patentee the right to use the patented invention

A trademark is a word, phrase, symbol, or design used to identify the source of goods or services sold, and to distinguish them from the goods or services of others. For example, the Coca-Cola[®] mark and the design that appears on their soft drink cans identifies them as products of that company, distinguishing them from competitors such as Pepsi[®]. Trademark law primarily prevents competitors from “infringing” upon the trademark, i.e., using “confusingly similar” marks to identify their own goods and services. Unlike copyrights and patents, trademark rights can last indefinitely if the owner continues to use the mark. (Kinsella, 2001)

2.2.3 Copyright and related rights

Copyright is a right given to authors of “original works,” such as books, articles, movies and computer programs. Copyright gives the exclusive right to reproduce the work, prepare derivative works, or to perform or present the work publicly. Copyrights protect only the form or expression of ideas, not the underlying ideas themselves.

It is noted that copyrights are not perpetual, rather it lasts for the life of the author plus seventy years, or for a total of ninety-five years in cases in which the employer owns the copyright. (Kinsella, 2001)

In US Copyright Law, for example the Act of 1790 give a copyright term of 14 years + 14 years renewal for books, maps and charts. The Act of 1831 give musical compositions a 28 years + 14 years renewal term. The latest US Copyright Act of 1976 give original works of authorship a term of Life of author + 50 years (Waxer 2006)

The latest “addition” to Copyright is “Moral rights”. This refers to the personal rights of authors to prohibit others from tampering with their works.

The unprecedented RM750,000 High Court Award to Datuk Syed Ahmad Jamal for infringement of his moral rights is rightly conciliatory instead of compensatory because of proprietary and ownership questions. But Syed Ahmad, as the ‘biological father’ of the sculpture ‘Lunar Peak’, has moral obligations to the destiny of his work. (Ooi, 2010)

2.2.4 Trade Secret

The word “Secret” arouse most people’s interest, and commercial secret whether it is a secret recipe or a confidential tender pricing information to the National Defense secrets are all very sensitive issues. Hence many organizations institute a trade secret management program that monitors and controls misappropriation of trade secrets , violation of trade secrets and often conducted a trade secret audit.

Worldwide, the law protecting confidential business information (or trade secrets) is very varied. What can be classified as confidential information and how it can be protected, how to share a secret, which are good models of non-disclosure agreements (NDA) etc are some of the IP issues that were discussed in a conference paper “Disclosing Confidential Information” (Irish, 2003)

All companies have secrets. Some are technical such as the detailed specification of a manufacturing process; some are business-related such as a list of customer names and addresses, which would be useful to a competitor. Some are of enormous value, for example the recipe for Coca Cola; others are less valuable. Some are simple, even one word long, such as the name of a company takeover target, others are complex, such as the details of a planned advertising campaign. The common factor is that all can be protected.

Restaurant recipe is thus one of the IP that can be protected, so is manufacturing process and engineering work procedure, hence we find many engineering services company classified many of their methodology statements / Work Procedures as **Proprietary** item and copying is prohibited

One of the most common indirect IP infringement or the the biggest loss of confidential information from a company occurs when its staff leave and move to another firm in the same area of business. The confidential information is used as a competitive advantage to fight the previous companies. Thus an important factor in protection is proper management control. Managers should restrict access to secrets to the staff who need to know. Also it is important to mark documents with a word such as "confidential". Other security precautions may be needed, such as imposing password protections on access to information. (Irish, 2003). When a staff leave the company, the password is immediately changed.

On the other hand, sometimes it is necessary to share a secret with another company. Often when a company outsourced some of its components, it needs to furnish the vendors and subcontractors with some details. To protect the IP, the outsourced company is required to sign a Confidentiality Agreement, sometimes called a Non-Disclosure Agreement (NDA)

Today's business environment has increased the importance of trade secret protection for business by developing and implementing information protection practices that address the risks associated with a global marketplace, rapid advances in technology and telecommunications, a mobile, highly-skilled work force, and networked strategic business relationships, including extensive outsourcing. Technology is changing so rapidly that trade secret protection is, in some cases, the most attractive, effective and readily available intellectual property right. As with all intellectual property, trade secrets can be valuable to a company's growth and competitive advantage, and sometimes even its survival (WIPO 2002)

2.2.5 Digital IP; Software Piracy; IP Panorama

Digital IP is the most current "affairs" in IP issues. The recent Google episode in China is a testimony of the controversies surrounding digital IP

Like many other well-known organizations, Google face cyber attacks of varying degrees on a regular basis. In mid-December 2009, they claimed that they detected a highly sophisticated and targeted attack on their corporate infrastructure originating from China that resulted in the theft of intellectual property from Google. However, it soon became clear that what at first appeared to be solely a security incident, was something quite different. Apparently Google have evidence to suggest that a primary goal of the attackers was accessing the Gmail accounts of Chinese human rights activists.

Google launched Google.cn in January 2006 in the belief that the benefits of increased access to information for people in China and a more open Internet outweighed their discomfort in agreeing to censor some results. But the above mentioned attacks and the surveillance uncovered, combined with the attempts over the past year to further limit free speech on the web, have led Google to conclude that they should review the feasibility of their business operations in China. They have decided they are no longer willing to continue censoring our results on Google.cn (Drummond 2010)

The emergence of e-commerce has enormous impact on digital IP. Issues associated with digital IP include IP protection in software, on-line contents-distribution, domain name issue, what elements of a company's website can be protected and so on

The technological convergence of the means of mass communication has produced a new situation regarding intellectual property, particularly in connection with the internet. (Clausen 2004)

The subject of digital, media and IT rights has seen some controversy in the current era of human rights that reject unauthorized intrusion of personal privacy and personal asset security (for example, some latest IT allow the tapping of an internet-users' computer/software information as soon the users log-in the net). Global governance and protection of computer software as well as the legal mechanisms of their enforcement need

some careful planning. Undeniably there are still many challenge facing digital rights management.

Software piracy covers piracy of all packaged software that runs on personal computers (PC), including desktops, laptops, and ultra-portables. This includes operating systems, systems software such as databases and security packages, business applications, and consumer applications such as games, personal finance, and reference software.

Software that was legitimately free, such as shareware or some open source software, was not considered pirated. Pirated CDs are classed under digital IP. IP Panorama was developed jointly by the Korean Intellectual Property Office (KIPO), the Korea Invention Promotion Association (KIPA), and the World Intellectual Property Organization (WIPO)

IP Panorama deals with IP issues from a business perspective, especially focusing on the situation of SMEs. IP Panorama was designed to help SMEs utilize and manage intellectual property (IP) in their business strategies.

We found the IP Panorama web-site are very comprehensive in its IP education and information. It certainly live up to its claim that it is “The Most Advanced E-learning Content on Intellectual Property for your Business” (WIPO 2010). It comprises 12 chapters all of which are very informative (and audio as well) covering a wide range of topics such as Importance of IP foe SME, Trademarks and Industrial Designs, Invention & Patents, Trade Secrets, copyrights & related rights, Patent Information, Technology Licensing in a Strategic Partnership, IP in the Digital Economy, IP and International Trade, IP Audit, Valuation of IP Assets and Trademark Licensing

2.2.6 IP Audit

An IP Audit is defined as a systematic review of the IP assets owned, used or acquired by a business. Its purpose is to uncover under-utilized IP assets, to identify any threats to a company’s bottom line, and to enable business planners to devise informed strategies that

will maintain and improve the company's market position. (WIPO 2010)

In many cases SME's do not have the resources to conduct a full audit of all its IP and will find it difficult to put a value to each of the components making up an IP portfolio

The first step in the Audit process is to identify the readily identifiable IP. Assets falling into this category will include any registered trademarks, copyrights, designs or patents owned by the business, any licenses to third parties and any licenses from third parties, including cross-licenses. Also included in this category are things such as in-house work manuals, databases, recipes, franchise agreements, publications and product/process know-how. Once identified the IP's are then scrutinized to determine who owns them, whether they have not lapsed (remain registered) and enforceable and whether they are being effectively used.

2.3 Academic Patenting, Plagiarism

As stated earlier one of the main players in IP strategy is institution of higher learning including universities and colleges. Governments implement IP strategy with inputs from universities and research institutions to encourage and facilitate effective creation, development and management of intellectual property. The issues of IP in relation to universities can be viewed from 2 perspectives

- i) protecting the universities' research and inventions
- ii) preventing their students as well as their research staff from plagiarism

i) Universities and other public research organizations are increasingly protecting their inventions, from genetic inventions to software (Cervantes, 2003) .

The general strengthening of intellectual property protection world-wide as well as the passage of legislation aimed at improving technology transfer are additional factors that have facilitated the expansion of patenting in academia in OECD countries (Cervantes, 2003)

There is legislation in USA, namely the Bayh-Dole Act (1980) that granted recipients

of federal R&D funds the right to patent inventions and license them to firms. The main motivation for this legislation was to facilitate the exploitation of government-funded research results by transferring ownership from the government to universities and other contractors who could then license the IP to firms.

Encouraging universities to commercialize research results by granting them title to IP can be useful but it is not sufficient to get researchers to become inventors. The key is that institutions and individual researchers have incentives to disclose, protect and exploit their inventions

Incentives can be “sticks” such as legal or administrative requirements for researchers to disclose inventions. Incentives can also be “carrots” such as royalty sharing agreements or equity participation in academic start-ups

The combination of all the above elements have contributed to universities being one of the lowest infringement entity in our study

Lastly, universities must not forget they have a duty balancing IP protection with the need to maintain public access

ii) One of the strongest message that all universities want to warn their students is the issue of “ **Plagiarism**”

Plagiarism and copyright violation are topical subjects, at least in universities. Cheating by students was at one time relatively rare, but in recent years there has been a massive upsurge in cheating encouraged by two major factors, (1) shifted emphasis from examination to course work for which cheating is easier and more difficult to detect; (2) easy access to electronic sources. (Anderson and Gash, 2000)

Fortunately most universities have a very strict discipline and impose heavy penalty on plagiarism.

2.4 IP for Business, IP and International Trade

With the continued progression towards a more globalized economy, multinational businesses are having increased difficulty in protecting their IP from theft or infringement. Though these multinationals may demand some actions from the home or host countries. Home countries' government are generally sincere in their efforts to champion their MNCs' causes, yet geopolitical factors intrude to reduce their effectiveness. And host countries would rather have proprietary technology in their own citizens. Even when the host countries' governments feel their long term interests are advanced by protecting foreign investors' IP, they often cannot due to cultural and or political limitations (Haley 2000)

Thus despite recent efforts by the international community to establish international norms for the transfer of intellectual property, the efforts have not been very successful. It is thus important that international business organizations must be made aware of why IP rights are important for exporters. It should check on the freedom to operate, understand IP in international outsourcing and protecting the company's IP rights in export market. It must ensure the company's overseas operations do follow IP rules in that country. It must practise same good policy & discipline of observing IP rights consistently in every country the company operates.

International policies toward protecting intellectual property rights (IPRs) have seen profound changes over the past two decades. Rules on how to protect patents, copyrights, trademarks, and other form of IPRs have become a standard component of International trade agreements such as WTO's Uruguay Round of multilateral trade negotiations. (WTO 2010)

A good IP strategy can enhance export opportunities of a company in many ways. Firstly IP rights, especially patents, may open up new export opportunities. Secondly, IP rights, especially trademarks and industrial designs, may help a company to develop an advantageous market position in export markets. Lastly IP rights enhance the opportunity of

winning loyal clientele for the company's products and services in export markets. (WIPO SME 2010)

2.5 Technology Transfer & Licensing; Strategic Partnership

Technology transfer is the process of getting ideas and inventions out of the research environments where they are developed and transferred into the hands of those who will commercialize them, or from a party with the know-how to another party lacking it. The key issues are how rights are regulated, intellectual property protected, what risks and liabilities need to be considered and the importance of confidentiality, and conflicts of interest between stakeholders (such as those who fund and those who develop, innovators and licensees, organizations and employees) (Flower 2007)

The process covers understanding the basic concepts of a license, preparing to license, negotiating a license agreement, overview of a license agreement and managing a license agreement

Technology transfer (TOT) is important for economic development. It can be defined as transfer of new technologies from universities and research institutions to parties capable of commercialization. Or in the sense of transfer of technologies across international borders, generally from developed to developing countries. From multinational corporations (MNC) to SME (small medium enterprise)

In technology rich countries, there is a vast pool of know-how waiting to be untapped. In emerging markets, there is an enormous demand for know-how, waiting to be filled. This 'trade in technology' or 'technology transfer' could well be one of the answers to a changing world. But we need to improve the matching process for this trade ie through licensing, strategic alliance and other avenues. (Verhulst 2000)

Generally TOT consists of knowledge or IP rights that are:

- licensed in the form of intellectual property,
- the subject of formal consulting or training agreements,
- communicated in the work place or research settings,
- diffused by publication or other means.

In the field of education, the most recent development in this TOT is the twinning of colleges and the set-up of many branch campuses of an established University in another foreign Country such as Monash & Nottingham University in Malaysia, It also includes the licensing of certain university courses to a private colleges

One of the effects of globalization is the relocation of production from the technology- rich countries towards low labour-cost countries. This is a threat for SME suppliers and manufacturers in technology-rich countries, whose customers turn their attentions to low labour- cost countries. On the other hand, this trend creates opportunities for contract manufacturers and service industries.

From a historical and international perspective, we are witnessing a dramatic shift in the importance of the five main drivers for value adding: technology, production, marketing, logistics and support. From a historical and international perspective, technology –in the form of know how and trade secrets- has emerged as a key factor in this process.

When it comes to transfer of know how and trade secrets which are hardly “patentable” –as is the case with most industrial know-how, both parties, licensor and licensee alike, still seem to be reluctant to cross bridges. (Verhulst, 2000)

Transfer of know-how and trade secrets is not restricted to “technical” know-how. Know-how in each of the value adding activities is “fit for transfer”. Production and logistical know how are the first choices when it comes to contract manufacturing. Companies that want to increase their share in emerging markets may opt to transfer their marketing secrets and support know how to local companies in those markets in return for a

royalty on sales volumes.

Unfortunately, the licensing instrument is underutilized by SMEs. For the bigger part, this is because licensors are afraid of uncertainties about the protection of their intellectual property, including trade secrets.. On the other hand, licensees are reluctant to accept the often severe restrictions that come with license agreements. These in turn are the result of licensors being overcautious to protect their interests

2.6 Intellectual Property (IP) Awareness

IP Awareness is one of the important factors that influence infringement on IP. Governments and IP organizations such as WIPO (World Intellectual Property Organisation) work hard to raise awareness, understanding and appreciation of intellectual property and its role and value in the society. There are also IP Foundations & IP Trust. Industries that are seriously threaten by piracy like the film industry had formed the IPAF (Intellectual Property Awareness Foundation). Their slogan “If you don’t think about what is happening in your society today you’ll lose the ability to influence it” touches people’s heart. (IPAF 2010)

IP Awareness can be enhanced by promotion, education and training, incentives and even enforcement.

2.7 Linkage of the literature review to the theoretical framework

The literature review above has provided us some ideas to design the theoretical framework. We had learnt the importance of technology transfer in global business, at the same time we also read that there are many obstacles to technology transfer and licensing. (Verhulst, 2000)

Hence technology and R&D will constitute a factor to study in our theoretical framework. and our questionnaires include items like licensing, technical alliance which has been extensively studied in our literature review (WIPO SME 2010)

The trend in patent application has been very similar to that for R&D expenditures

since 1999, which suggests that R&D is closely related to IP protection. (Hiroshi Kato 2006)

With current globalization of business, multinational companies are operating in many countries, and sourcing globally, we know the country of origin of a company will affect a company's policy and its direction. Country of origin thus is another independent variable being studied in our theoretical framework.

In the United Nations University's study in conjunction with WIPO, it has been shown that 'patent obtained' and 'patent applied' are positively related to the IP index as well as to 'R&D' and GDP. Hence these factors are included in our theoretical framework (Hiroshi Kato 2006)

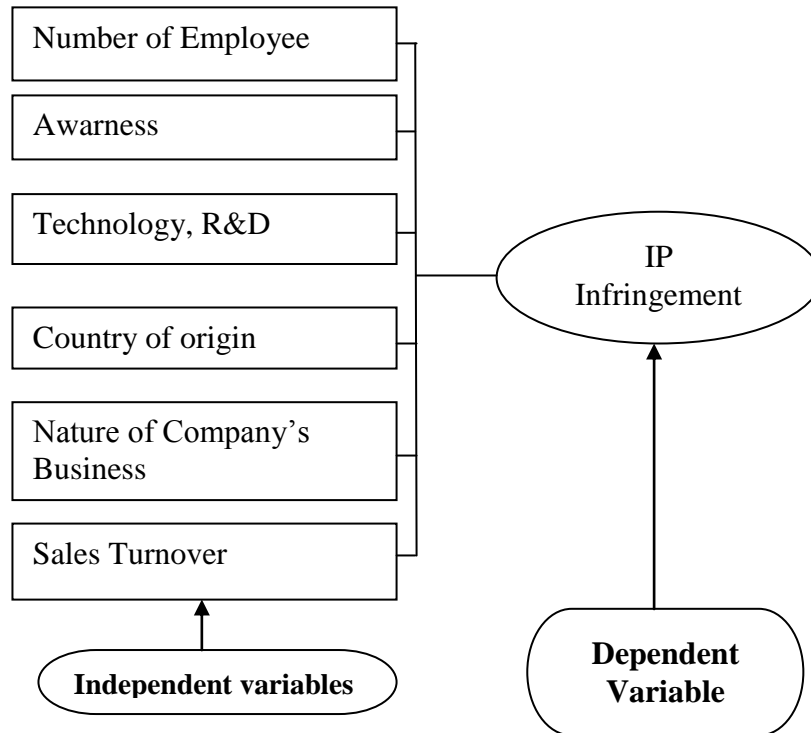
We had learnt that are many forms of IP ranging from invention and patent that are abundant in engineering companies, to basic copyrights and digital IP and software piracy that are everywhere in our daily life, hence affecting more on the consumer companies, we had seen how strict is the regulation in financial companies as evident from the typical case with UOB. We had learnt how engineering companies requires more design & invention to excel in their business, how engineering companies engaged in reverse engineering for their survival but reverse engineering is a form of IP infringement. We read how universities handle the issues of plagiarism and patent their academic research findings.

All above facts that we had learnt in our literature review convinced us that the nature of the business of a company is important to be an independent variable in our theoretical framework as different field of works and nature of business requires different form of IP, exercise different level of control and discipline, hence may solicit different level of IP infringement.

Engineering companies need a lot of technology and know-how, if they do not have the resources to develop it or to acquire it. They have no choice but to 'steal' the IP. Financial institutions is highly regulated and the consequence of improper practice is too great for them

to bear, hence financial institutions are less likely to infringe on IP.

2.8 Theoretical Framework



The framework is represented by **the logit regression model** as follow:-

$$\log P/(1-P) = \beta_1 + \beta_2(\text{EMP}) + \beta_3 (\text{Aware}) + \beta_4 (\text{Tech}) + \beta_5(\text{Origin}) + \beta_6\text{Bus1} + \beta_7\text{Bus2} \\ + \beta_8\text{Sales1} + \beta_9\text{Sales2}$$

Where

The dependable variable, infringement

INF = 1 if firm infringes IP

= 0 otherwise

P = probability of IP infringement by firm

EMP = number of employees of the firm

Aware = 1 firm is aware of IP infringement

= 0 otherwise

Tech = 1 if firm uses 'legal' technology

= 0 otherwise

Origin = 1 if country of origin of firm is in developed countries

= 0 otherwise

Bus 1 = 1 if the firm is in the financial, medical and educational service sector
= 0 otherwise

Bus 2 = 1 if the firm is in the consumer and other services sector
= 0 otherwise

(The base category for the dummy variable for Bus is engineering sector)

Sales 1 = 1 if the firm's annual sales turnover is between RM 1 million and RM 10 million
= 0 otherwise

Sales 2 = 1 if the firm's annual sales turnover exceeds RM10 million
= 0 otherwise

The above range of turnover had been chosen because we want to sample the smallest company which has very limited resources. The range of turnover 'between RM1 million to RM 10 million' which represent the vast majority of SME. Lastly companies with turnover above RM10 million are considered above the 'threshold' capability to secure original IP if they wanted to. So companies in this range it is the company's philosophy/attitude rather than their limited resources that made them infringe on IP (if they did)

(The base category for the dummy variables for SALES is firm with annual sales turnover of less than RM 1 million)

2.7 Hypotheses Development

The hypotheses developed in this project are written in the "Null Hypotheses" form. From the results, we either reject or accept the null hypotheses.

Hypothesis (1)

H₀: $\beta_2 = 0$

(Number of employee has no effect on the IP infringement)

H₁: $\beta_2 < 0$

(Bigger companies with more employees are less likely to infringe IP)

Hypothesis (2)

H₀: $\beta_3 = 0$